



VERMONT

Department of Environmental Conservation

Drinking Water and Groundwater Protection Division

Vermont's Public Drinking Water Systems Capacity Development Program Triennial Report to the Governor 2014



Our mission is to ensure that public water systems have the technical, managerial, and financial capabilities to provide Vermont's citizens and guests safe, affordable drinking water – now and into the future.

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Executive Summary

The Capacity Development Program's mission is to help public water systems improve their technical, managerial, and financial capabilities so they can serve their customers safe drinking water. The program uses a number of tools to fulfill its mission, including the Drinking Water State Revolving Fund (DWSRF); sanitary surveys; long-range plans; source water assessments; operator training and certification; capacity evaluations and consultations; and source, construction, and operating permits. This triennial report provides an overview of the program, the effectiveness of its strategies, and the recent progress made towards improving the capacity of Vermont's public water systems.

The services public drinking water systems provide are vital to the health, safety, and economies of our communities. And the people managing these systems face significant challenges as they try to provide their customers a sufficient amount of safe, affordable water. Challenges include managing, repairing, and replacing aging and inadequate infrastructure; achieving financial viability; increasing resiliency to climate related events; recruiting and retaining qualified staff; responding to emergencies; adjusting to changes in demand for services; overcoming resistance to rate increases; adapting to changes in source water quality and quantity; addressing emerging contaminants (e.g., blue-green algae, pharmaceuticals, and personal care products), and complying with new and more stringent regulatory requirements.

In the past three years, the Capacity Development Program helped many public water systems improve their capabilities and comply with drinking water regulations. In 2014, 97 percent of the people served by community water systems received water that met all of the health-based standards. This was up from 89 percent in 2012. Also, based on compliance scores that consider all federal drinking water rules, fewer systems are now an immediate enforcement concern.

But as drinking water infrastructure continues to age and degrade, systems will struggle to comply with regulations and meet their customers' expectations. Feeling pressure to keep rates low, many public water systems are not making the investments needed to properly maintain, repair, rehabilitate, and replace their assets. EPA estimates that Vermont needs to invest more than \$510 million in public drinking water infrastructure in the next twenty years to ensure the health, security, and well-being of our communities (Drinking Water Infrastructure Needs Surveys and Assessment, Fifth Report to Congress, April, 2013).

Meanwhile, the amount of public financing available to systems has declined. Contributions to Vermont's DWSRF during the last three year period, for example, were about 55 percent less than those from the previous three year period (16 percent less excluding the grant from the American Recovery and Reinvestment Act of 2009). DWSRF money is used to provide public water systems planning and capital improvements loans and other types of capacity development assistance. The loans allow systems to replace aging infrastructure, upgrade water treatment plants, and develop new water sources.

Money from utility reserves and public financing is not enough to address Vermont's drinking water infrastructure needs. This financial shortfall is the greatest challenge for most public community water systems. So in 2015, the Capacity Development Program is revising its strategy to include new

tools and initiatives to help systems meet this challenge. The new strategy, for example, will have several initiatives to encourage systems to create and use an Asset Management Program.

An effective Asset Management Program uses detailed asset inventories, operation and maintenance tasks, life-cycle cost analyses, and long-range financial planning to build capacity and make systems more sustainable. It can help systems operate more efficiently, prolong asset life, plan and pay for future repairs and replacements, make informed decisions (e.g., when to conduct maintenance activities; whether to repair, rehabilitate, or replace an asset), justify system needs and decisions, set and gain support for appropriate user rates, meet service expectations and regulatory requirements, improve emergency response, make the best use of limited resources, plan for better capital projects, reduce vulnerability to hazards (e.g., flooding), and become more resilient.

Most of our drinking water infrastructure is buried, so to many people it's "out of sight, out of mind". But we should not take the services it provides for granted. We need to invest more money in the infrastructure. And its managers need to use better financial and management practices to operate, maintain, repair, rehabilitate, and replace assets. Otherwise, we will not be able to continue to rely on our drinking water infrastructure for disease protection, fire protection, basic sanitation, economic development, and to support our quality of life.



Introduction

Vermont's public drinking water systems face significant challenges as they try to comply with regulations, repair and replace aging infrastructure, and achieve financial viability. The Drinking Water and Groundwater Protection Division (DWGPD) created the Capacity Development Program to help address these challenges and to meet the requirements of the federal Safe Drinking Water Act's 1996 Amendments. The program's objectives are:

- To ensure that new community (CWSs) and non-transient non-community (NTNCs) systems demonstrate the technical, managerial, and financial capacity to provide a sufficient quantity of safe water in a cost-effective manner now and into the future; and
- To help existing systems become more sustainable by improving their technical, managerial, and financial capabilities.

Technical capacity refers to a system's physical and operational abilities. Examples of strong technical capacity include:

- The system has qualified operators with the knowledge and skills to operate the system.
- The system's infrastructure (i.e., source, storage tanks, treatment plant, and distribution network) can meet current and anticipated demand.
- The system's infrastructure is adequately protected, treated, and sampled.
- The system's infrastructure is in good condition.

Managerial capacity refers to a system's administrative and organizational abilities. Examples of strong managerial capacity include:

- Owners, managers, and operators are accountable and knowledgeable about the water system.
- Owners, managers, and operators receive ongoing training.
- The system plans for current and future needs.
- The system interacts well with customers and regulators.

Financial capacity refers to a system's abilities to generate or obtain enough money to maintain the system and pay for future improvements. Examples of strong financial capacity include:

- The system's revenues pay for the full cost of services.
- The system knows and can measure all costs and revenues.
- Reserves are available for unexpected expenses.
- The system uses good budgeting and accounting practices.
- The system can access capital through public or private sources.

Figure 1. Vermont's public water systems (PWSs):

The 1,367 PWSs in Vermont include 420 community, 246 non-transient non-community, and 701 transient non-community systems.

Community water systems serve 25 or more year-round residents or have 15 or more year-round residential connections;

Non-transient non-community water systems serve 25 or more of the same people at least six months per year. Examples include daycares, schools and office buildings; and

Transient non-community water systems serve 25 or more people per day at least 60 days per year. The persons served need not be the same people. Examples include delis, hotels, campgrounds and restaurants.

This triennial report provides an overview of the Capacity Development Program, the effectiveness of its strategies, and the progress made toward improving the technical, managerial, and financial capacity of Vermont’s public water systems during the past three years. The report’s first section focuses on the program’s strategy to ensure that all new CWSs and NTNCs demonstrate the capacity to comply with drinking water regulations. The next section focuses on the program’s strategy to help existing systems improve their capacity. It describes how the program identifies systems that need assistance and some of the tools used to help build capacity. The last part of the report describes the program’s plans for the near future.

Capacity Development Strategy for New Public Water Systems

Section 1420(a) of the Safe Drinking Water Act requires the state to ensure that all new CWSs and NTNCs beginning operations after October 1st, 1999, demonstrate the capacity to comply with regulations. Vermont’s legal authorities to implement this requirement are in statute (10 V.S.A. § 1685) and rule (Environmental Protection Rules, Chapter 21 Water Supply Rule). There were no changes to these legal authorities during the past three years.

Control Points

The Water Supply Rule (Environmental Protection Rules Chapter 21) prohibits a new CWS or NTNC from operating before demonstrating that it has adequate technical, managerial, and financial capacity. The rule also outlines the criteria to demonstrate capacity, and includes several control points – places where the DWGPD can exercise its authority - to ensure a new system will have adequate capacity (see Figure 2). Each control point marks a significant milestone in demonstrating capacity. The DWGPD makes a formal determination as to whether a system has adequate capacity at two points – before issuing the construction and operating permits.

During 2013, the DWGPD revised some internal procedures related to the control points. Now, for new CWSs and NTNCs, the Capacity Development Coordinator reviews and approves the Long Range Plan, conducts a sanitary survey, and issues the operating permit. These tasks were previously done by other staff in the division. But from working with new systems as they build capacity, the coordinator will already understand their technical, managerial, and financial capabilities. So even though reviewing the Long Range Plan, conducting the survey, and issuing the operating permit will increase the coordinator’s workload, it will take less time than it would for another staff member who is not familiar with the system.

Figure 2. Control points to ensure that new CWSs and NTNCs have adequate capacity.

- ◆ *Source Protection Plan Approval*
- ◆ *Source Permit Issuance*
- ◆ *Long Range Plan Approval*
- ◆ *Construction Permit Issuance*
- ◆ *O&M Manual Approval*
- ◆ *Sampling Plan Approvals*
- ◆ *Operator Certification*
- ◆ *Operating Permit Issuance*

New System Capacity Determinations

The table below lists the new systems for which a capacity determination was completed during the last three years. It also lists proposed systems for which an evaluation is underway, but not yet completed, and a note regarding their status.

Table 1. Capacity evaluation status for new public community water systems (CWSs) and non-transient non-community water systems (NTNCs).

WSID	Water System Name	PWS Type	Date Activated	Capacity Review Status
VT0021348	Parker Office Building	NTNC	10/25/2011	Completed – Operating permit issued
VT0021349	802 Toyota	NTNC	11/1/2011	Completed – Operating permit issued
VT0021127	VT Mutual	NTNC	12/8/2011	Completed – Operating permit issued
VT0021079	NE Waste Services	NTNC	3/20/2012	Completed – Operating permit issued
VT0006069	Sunny Lane Daycare	NTNC	4/13/2012	Completed – Operating permit issued
VT0021345	Advanced Illumination, Inc.	NTNC	4/20/2012	Completed – Operating permit issued
VT0006624	Putney School	CWS	12/26/2012	Completed – Operating permit issued
VT0020928	Catamount-Malone	NTNC	12/28/2012	Completed – Operating permit issued
VT0020997	Waitsfield Water System	CWS	1/17/2013	Completed – Operating permit issued
VT0021394	Lamoille Family Center	NTNC	1/31/2013	Completed – Operating permit issued
VT0020355	2178 Airport Road	NTNC	2/8/2013	Completed – Operating permit issued
VT0021340	Border Patrol Swanton	NTNC	2/28/2013	Completed – Operating permit issued
VT0021361	Foundations to Success Daycare	NTNC	5/14/2013	Completed – Operating permit issued
VT0021218	Derby Border Patrol	NTNC	6/6/2013	Completed – Operating permit issued
VT0021368	Burr and Burton Academy Mountain Campus	NTNC	8/9/2013	Completed – Operating permit issued
VT0021405	Gifford Medical Kingwood Building	NTNC	1/17/2014	Completed – Operating permit issued
VT0020964	South Alburg Fire District #2	CWS	7/25/2014	Completed – Operating permit issued
VT0021202	Berlin Municipal Water System	CWS	Proposed	Construction permit issued
VT0021272	Timber Creek at Okemo	CWS	Proposed	Construction permit issued
VT0021345	Daniels Construction	NTNC	Proposed	Source permit application received
VT0021429	Smuggler’s Notch Development	CWS	Proposed	Source permit application received
VT0021446	The Binding Site VT	NTNC	Proposed	Source permit application received
VT0021448	Westminster Public Safety Building	NTNC	Proposed	Source permit application received
VT0021454	Heartbeet Community Center	NTNC	Proposed	Source permit application received
VT0021460	Battenkill Valley Health Center	NTNC	Proposed	Source permit application received

Effectiveness of the Capacity Development Strategy for New Public Water Systems

The best measure of the capacity development strategy's effectiveness for new water systems is whether they are in compliance with drinking water regulations, especially the health-based standards. If a public water system does not comply with a federal or state drinking water regulation, the DWGPD notifies them of the violation. The notification requires the system to inform the public of the violation and to return to compliance. If warranted, the DWGPD directs the system to take steps to protect public health (e.g., issuing a boil water notice). The division also offers the system technical assistance to help them return to compliance. If the system still does not comply, the division takes appropriate enforcement actions.

All of the new systems activated in the past three years are currently in compliance with the drinking water health-based standards. During 2014, however, three of the systems violated a health-based standard of the Total Coliform Rule.

- South Alburg Fire District #2 and Sunny Lane Daycare – coliform bacteria were found in multiple samples from both systems. The systems issued boil water notices while they addressed the contamination issues.
- Parker Office Building – coliform bacteria were found in two samples, but the event did not trigger the requirement for a boil water notice.

The systems kept their customers informed during the contamination events. They also worked with DWGPD staff to resolve the issues and to make sure the water was safe to drink. *E. coli* bacteria were not detected at any of the systems and no adverse health effects were reported. All three systems are now back in compliance with the health based standards.

Another important compliance and capacity measure is EPA's Drinking Water Enforcement Tracking Tool (ETT) score. The ETT score measures noncompliance across all federal rules, placing a higher weight on the health-based standards. A violation of an acute maximum contaminant level, for example, carries more weight than that of a reporting violation. A score is calculated for each system based on violations occurring within the past five years and any older open-ended violations. It does not include violations for which the system has returned to compliance, or has been issued an enforceable directive to return to compliance (e.g., a schedule in an operating permit).

The DWGPD uses the ETT to help prioritize enforcement actions and capacity development assistance. Table 2, below, includes the ETT status of new CWSs and NTNCs activated during the past three years. Systems that exceed a score of ten become an immediate enforcement priority. Those with scores of ten or less are tracked closely. No system activated in the past three years has a score of more than ten.

Table 2. Compliance status of new public community water systems (CWSs) and non-transient non-community water systems (NTNCs) activated within the last three years.

WSID	Water System Name	PWS Type	Date Activated	ETT Score
VT0021348	Parker Office Building	NTNC	10/25/2011	6
VT0021349	802 Toyota	NTNC	11/1/2011	5
VT0021127	VT Mutual	NTNC	12/8/2011	0
VT0021079	NE Waste Services	NTNC	3/20/2012	0
VT0006069	Sunny Lane Daycare	NTNC	4/13/2012	6
VT0021345	Advanced Illumination, Inc.	NTNC	4/20/2012	0
VT0006624	Putney School	CWS	12/26/2012	0
VT0020928	Catamount-Malone	NTNC	12/28/2012	0
VT0020997	Waitsfield Water Supply	CWS	1/17/2013	0
VT0021394	Lamoille Family Center	NTNC	1/31/2013	0
VT0020355	2178 Airport Road	NTNC	2/8/2013	2
VT0021340	Border Patrol Station Swanton	NTNC	2/28/2013	3
VT0021361	Foundations to Success Daycare	NTNC	5/14/2013	3
VT0021218	Derby Border Patrol	NTNC	6/6/2013	0
VT0021368	Burr and Burton Academy Mountain Campus	NTNC	8/9/2013	0
VT0021405	Gifford Medical Kingwood Building	NTNC	1/17/2014	0
VT0020964	South Alburgh Fire District #2	CWS	7/25/2014	5



Capacity Development Strategy for Existing Public Water Systems

Section 1420(c) of the Safe Drinking Water Act requires the state to develop and implement a strategy to help existing public water systems acquire and maintain technical, managerial, and financial capacity. On July 28th, 2000, the DWGPD published its “Existing Public Water System Capacity Strategy”. The strategy’s five major components are listed in Figure 3. Over the years, the DWGPD has used some tools not listed in the strategy to help systems improve their capacity. But the strategy has not been updated since its initial publication. So the DWGPD plans to revise the strategy during 2015.

As of December 2014, there were 1,367 public water systems in Vermont, including:

- 420 community systems (CWSs),
- 246 non-transient non-community systems (NTNCs), and
- 701 transient non-community systems (TNCs).

About 70 percent of Vermonters are served by CWSs. Figure 4 shows a breakdown of the CWSs in Vermont by population served. Vermont is unique in that 72 percent of its CWSs are very small (i.e., serve 500 or fewer people). According to EPA, only about 56 percent of CWSs nationwide are this small (EPA Document 816-R-10-022, July 2011).

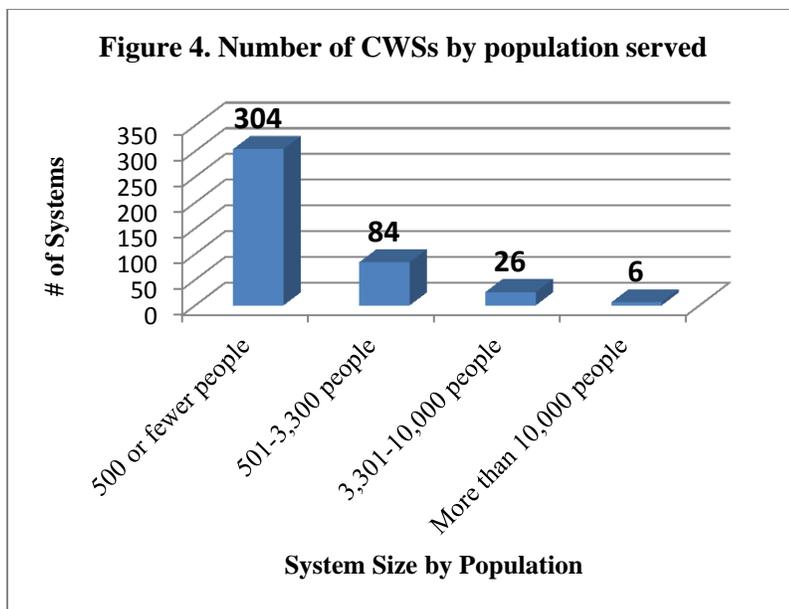


Figure 3. The *Existing Public Water System Capacity Strategy* describes:

- The methods or criteria used to identify and prioritize systems in need of capacity development assistance.
- The factors (e.g., legal, regulatory, or institutional) at the federal, state, or local level that encourage or impair capacity development.
- The ways the state uses its authorities and resources to help systems comply with regulations, encourage the development of partnerships between systems, and train and certify water system operators.
- The methods used to establish a baseline and measure improvements in capacity.
- The ways to involve interested parties in developing and implementing the capacity development strategy.

Most community systems in Vermont were created when regulatory standards were less stringent than they are today. The smallest systems are often run by part-time or volunteer staff with limited time and experience. And many do not generate enough revenues to cover the system's full costs because they have a small customer base and inadequate rates. Too often rates have been kept low by relying on volunteers or underpaid staff and deferring infrastructure maintenance, repairs and replacement.

Lacking strong capacity, these systems need the tools and training to help them operate in a more sustainable manner. They also need help identifying infrastructure needs and the resources to make improvements. Many small systems are not able to comply with regulations and protect public health without the technical, managerial, and financial assistance. So while the Capacity Development Program provides assistance to all types and sizes of public water systems, it focuses on the smallest community systems.

“I have been the sole caretaker of this system for nearly 20 years, with little help or no help from the water customers. I am 67 and want to retire but how? My wife takes care of the finances and does a great job. She has no experience with computers or financial records keeping. We do everything by paper and filing... I try to have at least annual meetings but no one shows up. I send letters and financial updates, apart from that I am a one man operation.” – A statement from a response to the capacity questionnaire (see below) describing the challenges facing a very small water system.

Identifying Systems that Need Assistance

The Capacity Program uses compliance data (e.g., Enforcement Tracking Tool scores) and sanitary survey findings to help identify systems in need of assistance. DWGPD staff conducts a sanitary survey at each system every three to five years, depending on the system's type (i.e., CWS, NTNC, or TNC), treatment, and water source.

During each survey, division staff reviews the system's compliance with regulatory standards and provides them guidance on how to improve operations and management. If the system wants or needs more technical, managerial, or financial assistance, the surveyor refers them to the Capacity Development Program. More information regarding sanitary surveys is included in the section below.

Information from capacity evaluations for systems applying for Drinking Water State Revolving Fund (DWSRF) loans is also used to direct assistance. The DWSRF Program Development Specialist completes most of the capacity evaluations for loan applicants. The Capacity Development Coordinator does the evaluations related to loans that involve a change in ownership. During the capacity evaluation, staff ensures that the proposed project is designed to address any technical deficiencies. For systems lacking managerial or financial capabilities, staff prepares a list of tasks that, if completed, will improve capacity. Depending on their importance, these tasks are either made as recommendations to the system, a requirement for loan approval or forgiveness, or included in the operating permit. The DWSRF Development Specialist and the Capacity Development Coordinator assist systems that request help

completing the tasks. The state does not award DWSRF monies to systems that lack adequate capacity unless the funds will improve the system's capabilities and address any chronic non-compliance issues.

Many systems currently in compliance and not seeking a DWSRF loan can also benefit from capacity development assistance. So in 2014 for the first time, all community water systems were asked to complete a capacity questionnaire. Two questionnaires were developed – one for systems serving 500 or fewer people and the other for those serving more than 500 people. The questionnaire for the smaller systems was a subset of those asked the larger systems. A copy of the questionnaire for the larger systems is in Appendix A.

The questionnaires were designed to help determine whether the water systems have adequate capacity and how to make them more sustainable. They include a series of questions related to the systems' technical, managerial, and financial capabilities. The questionnaires also have questions to help identify the greatest challenges systems face, and the types of training and assistance that would be most beneficial. And they ask if the system wants assistance from the Capacity Program and, if so, details on the assistance they need.

Fifty-five percent of the CWSs (232 of 420) responded to the survey. Of these, 65 systems stated that they want assistance from the Capacity Program. Items systems want help with include preparing budgets, revising ordinances, conducting water audits, developing emergency plans, complying with regulations, reviewing rate-structures, setting priorities for improvement projects, developing new water sources, financing infrastructure repair and replacement, and creating or updating master plans or asset management programs.

During 2014, the Capacity Coordinator began providing assistance to some of these systems. This work will continue next year. Results from the questionnaires are being used not only to target specific systems for assistance, but also to guide revisions to the capacity development strategy and decide how to allocate our resources to help improve drinking water system capacity.

Providing Assistance to Improve Capacity

During the past three years, the state continued to use tools identified in the capacity development strategy to help systems improve their technical, managerial, and financial capabilities. These tools include source, construction, and operating permits; sanitary surveys; operator certification; the Drinking Water State Revolving Fund (DWSRF); capacity assistance consultations; and source water assessments. Also, three new capacity development initiatives using set-aside funds from the DWSRF began during 2014. Some of the tools and the new initiatives designed to help improve system capacity are described below.

Sanitary Surveys

A sanitary survey is an on-site inspection of a system's water source, facilities, equipment, operation, and maintenance. The surveys are conducted by DWGPD staff. During a survey, the inspector identifies sanitary deficiencies and assesses a system's capability to supply safe drinking water. A compliance schedule to address any deficiencies is then incorporated into the system's operating permit. Table 3 lists the number of sanitary surveys conducted during the past three years.

Table 3. Number of sanitary surveys conducted during the past three state fiscal years.

PWS Type	State Fiscal Year 2012	State Fiscal Year 2013	State Fiscal Year 2014
CWSs	145	226	108
NTNCs	112	59	126
TNCs	96	103	93
Total	353	388	327*

* - Fewer sanitary surveys were conducted in 2014 as compared to previous years due to DWGPD staff turnover.

Operator Certification

All public water systems are required to have a certified operator. The operators are responsible for protecting public health by operating and maintaining drinking water infrastructure in a safe, optimal, and reliable manner. Systems without a qualified, accountable operator lack the capacity to provide safe drinking water. As of December 31st, 2014, five community, six non-transient non-community, and seventy-four transient non-community drinking water systems did not have a certified operator. The DWGPD is working with these systems to ensure they obtain a certified operator. If they do not obtain a certified operator in a timely fashion they will be issued a violation and subject to enforcement activities.

The DWGPD's Operator Certification Program helps ensure that operators receive the training necessary to fulfill their duties. Currently, there are 1,137 certified operators and 27 operators-in-training. The division has contracts with the Vermont Rural Water and Green Mountain Water Environment Associations to conduct trainings. In 2014, the Capacity Development Program also coordinated an Asset Management training conducted by the Environmental Finance Center. A total of 4,495 training credit hours were awarded in 2012 and 3,870 were awarded in 2013. The number of credit hours for 2014 will be compiled and included in the next Operator Certification Program Annual Report, which will be available on July 1st, 2015.

Drinking Water State Revolving Fund

The 1996 Amendments to the Safe Drinking Water Act (SDWA) created the Drinking Water State Revolving Fund (DWSRF). The fund establishes a financial mechanism to help states achieve the SDWA's public health protection goals.

Each year, the Environmental Protection Agency (EPA) gives Vermont a grant to capitalize the fund. The State must match at least 20 percent of the federal grant. The money is used to provide public water systems planning and capital improvements loans and other types of assistance. Table 4, below, lists the federal grant monies and state match added to the fund for the past three years. The federal grant amount for federal fiscal year (FFY) 2015 is expected to be \$8,845,000, the same amount awarded in FFY 2014. This would require a state match of \$1,769,000 and result in a \$10,614,000 addition to fund.

Table 4. Federal grant monies and state match added to the Drinking Water State Revolving Fund the last three years.

Federal Fiscal Year	Federal Capitalization Grant Amount	State Match (20% of Federal Grant)	Total Capital Added to the Fund
2012	\$8,975,000	\$1,795,000	\$10,770,000
2013	\$8,421,000	\$1,684,200	\$10,105,200
2014	\$8,845,000	\$1,769,000	\$10,614,000
Three Year Total	\$26,241,000	\$5,248,200	\$31,489,200

Monies from Vermont’s DWSRF are critical to helping public drinking water systems achieve and maintain technical, managerial, and financial capacity. The SDWA requires the state to prepare an Intended Use Plan each year that describes how the DWSRF monies will be spent. Most of the monies are used to fund loans to public water systems for capital improvement projects. About 80% of federal grant and 100% of the state match from FFY 2014, for example, are earmarked for construction loans. Systems serving disadvantaged communities are often eligible for some principal forgiveness and more favorable loan conditions (i.e., longer terms and negative interest rates).

To date, loans of more than \$168 million have been awarded through the DWSRF, including about \$18 million from the American Recovery and Reinvestment Act of 2009. The table below lists the number of executed loans and the amounts for each of the past three state fiscal years.

Table 5. Loans from the Drinking Water State Revolving Fund executed in the last three years.

State Fiscal Year	Number of Loans Executed	Dollar Amount of Loans*
2012	43	\$15,424,355
2013	59	\$14,671,673
2014	44	\$21,213,974
Total	146	\$51,310,002

* - The loans executed in a given year may include funds from the current year’s federal grant and state match, as well as monies from interest earnings, loan repayments, and uncommitted funds from previous years.

During state fiscal years 2012 thru 2014, the DWSRF executed loans of more than \$51 million - a record high for a three year period. However, many of these loans were financed using unspent funds from previous years’ grants. The DWSRF will probably not be able to continue to lend this much money.

While the vast majority of the DWSRF monies are used for planning and construction loans, a small percentage is earmarked for other types of assistance. These other types of assistance are referred to “set-aside” activities. Some of the more recent set-aside activities are described below.

Leak Detection Surveys

Finding and repairing leaks in a timely fashion can minimize wasteful water withdrawals, reduce treatment costs, capture lost revenue, prevent disruptions to the water system, and protect public health. So during 2014, the Capacity Development Program offered free leak detection services to CWSs.

To be considered for the services, systems had to submit a project request identifying the miles of pipe they want to be surveyed, the pipe's age and material type, and any additional information demonstrating why the system would benefit from the project (e.g., results of a recent water audit, or examples of system water shortages or low pressure events thought to be caused by leaks). The system also had to agree to assist with the survey (i.e., preparing maps, locating listening points, exercising valves, etc.), and fix any leaks found.

The leak detection surveys were conducted in accordance with the American Water Works Association's "Water Audits and Loss Control Programs" manual (Manual of Water Supply Practices M36, 3rd Edition, 2009). Surveys were conducted at twenty-five systems, covering 155 miles of pipe. Fifty-one leaks were pinpointed with an estimated leakage of 361 gallons per minute (519,840 gallons per day). In most cases the leaks were repaired in a timely fashion. At one system, several sections of the distribution network were found to be in such poor shape that the municipality is going to replace them rather than do repairs. They are seeking funds from the DWSRF to complete the work.

Leak detection surveys should be conducted at community water systems on a regular basis. One of the project's goals was to raise awareness about the value of leak detection surveys, and to encourage systems to make them part of routine operations and maintenance activities. The project was so successful that we plan to offer the services again next year. Because funds for the project are limited, the program will award leak detection surveys to the water systems that demonstrate the greatest potential benefits.

Flood Vulnerability Assessments

Many of Vermont's communities are susceptible to flooding because of our landscape (e.g., steep slopes) and development patterns. Floods are already one of the most common hazards in Vermont. And as the intensity and frequency of storms increase due to climate change, so do the risks of significant flood damage.

During the year, the Facilities and Engineering Division (FED) in consultation with the DWGPD started a flood resilience project. Using funds from the DWSRF set-asides, FED hired a temporary employee to help community water systems assess the vulnerability of their infrastructure to natural disasters, focusing primary on floods; and identify mitigation measures that will improve systems' resiliency to natural disasters.

Some mitigation measures will require significant financial investment. To encourage systems to make these investments, FED plans to award additional DWSRF construction loan priority points to projects that will improve resiliency.

Asset Management Workshops and Assistance

As Vermont's drinking water system infrastructure continues to age and degrade, the shortfall between the money available and that needed to properly operate, maintain, repair, and replace this infrastructure grows. And yet customers still expect plentiful, safe, inexpensive water. This presents significant challenges for people managing and operating systems.

An asset management program can help meet these challenges. In the recent capacity questionnaire, water systems identified “creating or updating an asset management program, water system master plan, or other tool to help manage the water system” as a top priority. So the Capacity Development Program and FED are providing community water systems incentives to develop and implement asset management programs.

An effective asset management program uses a detailed asset registry, operation and maintenance tasks, life-cycle cost analyses, and long-range financial planning to build capacity and make systems more sustainable. Our division helped Waterbury Village staff develop a program as a pilot project. Building on this effort, we are using money from the DWSRF set-asides to help more systems create or update and use asset management programs. During the upcoming year, we will create a curriculum and conduct several workshop series that help participants develop and implement an asset management program for their water system.

Workshop participants that create a successful asset management program will serve as a model and resource for other water systems. And the curriculum developed for the workshop series will be available so the DWGPD can host similar trainings in the future.

An up-to-date map and asset registry are the backbone of a successful asset management program. But the time and effort needed to create a registry often prevents systems from implementing a program. So during 2015, we will hire consultants to help systems inventory, map, and assess the condition of their assets. Priority for this service will be given to systems attending the asset management workshops as an incentive to encourage participation.

The DWSRF planning and construction loan funds play a crucial role in helping systems improve their capacity. This year, the FED proposed changes to both funds to encourage systems to develop asset management programs. The proposed changes include planning loan forgiveness for projects stemming from an approved asset management program, and awarding additional priority points to CWSs seeking a construction loan for improvements identified using an asset management program. The state’s initiatives to encourage systems to create and implement asset management programs will be described in more detail in the revised capacity strategy.

The table below describes some other on-going capacity development initiatives. And Appendix B includes a list of capacity development projects completed in previous years.

Table 6. Some of the capacity development initiatives for existing public water systems.

Initiative	Target Audience	Description
Drinking Water State Revolving Fund (DWSRF) Program Changes	Potential DWSRF loan recipients	Changes to the program include a proposed requirement for loan recipients to create an asset replacement reserve fund, and incentives for systems to implement asset management programs (e.g., planning loan forgiveness and additional construction loan priority points). See the Intended Use Plan for details regarding the changes.

Training and Assistance	Public water system (PWS) owners and operators	Contract with Vermont Rural Water Association to provide technical assistance and conduct group and one-on-one trainings.
Legal Assistance	Community water systems (CWSs) and non-transient non-community (NTNCs) water systems receiving a DWSRF loan	Pays for legal services associated with DWSRF loan closings. Also pays for legal reviews for systems using DWSRF monies to purchase land or to acquire, merge with, or purchase another system.
User Rate Reviews and Budgeting/Assisting in the Development of Financial Capacity	CWSs	Systems have contacted the Capacity Development Coordinator for assistance in establishing an equitable user rate structure.
By-laws and Ordinance Development and Updates	CWSs	Several water systems requested help with creating or updating by-laws and ordinances.
Ownership restructuring	CWSs	Providing systems guidance while undergoing ownership changes (e.g., forming a Fire District to acquire a privately owned system, assisting with a merger between two municipal entities)
Technical Assistance and Contamination Investigations for Transient non-community (TNC) water systems.	TNCs	The DWGPD has a contractor available, on an “as-needed-basis”, to conduct contamination investigations at TNCs. Assistance includes determining the possible causes of contamination, making recommendations on how to improve the system and comply with regulations, discussing disinfection options, etc. This service has helped systems protect public health and come off boil water notices more quickly.
Board Member Owner Manual	CWSs	The manual outlines the responsibilities and liabilities for PWS board members and includes information on relevant laws, regulations, and policies, and a list of resources. A draft has been prepared. Next steps will be outlined in the revised capacity strategy.
Drinking Water & Groundwater Protection Division Newsletter- <i>Waterline</i>	All PWSs, Consultants, interested organizations	This is an effective means for communicating to a broad audience interested in hearing from the state on issues affecting public water systems. We have received feedback from readers that is highly supportive of the newsletter.

Effectiveness of the Capacity Development Strategy for Existing Public Water Systems

As with new systems, the best single measure of the effectiveness of the capacity development strategy for existing water systems is whether they are in compliance with federal and state drinking water regulations, especially the health based standards. The percentage of systems in compliance with the health-based standards has increased over the past three years (see table 7, below). During 2014, for example, 97 percent of the people served by community water systems were provided water that met all of the health-based standards. This number was up from 89 percent in 2012. These trends indicate that the Capacity Development Strategy is effective. The percentage is likely to decline in 2015, however, because the new maximum contaminant levels associated with the Stage 2 Disinfection Byproducts Rule go into effect.

Table 7. Percentages of systems and population served by systems in compliance with the health-based standards in the past three state fiscal years.

PWS Type	% of Systems in Compliance			% of Population Served by Systems in Compliance		
	2012	2013	2014	2012	2013	2014
CWSs	85%	88%	90%	89%	92%	97%
NTNCs	92%	93%	93%	91%	93%	93%
TNCs	91%	93%	95%	94%	91%	97%

The Drinking Water Enforcement Targeting Tool (ETT) scores are another compliance measure used to gauge capacity development efforts. An ETT score is calculated for each public water system as a measure of noncompliance across all federal rules. Systems that exceed a score of ten lack the capacity to comply with regulations and become an immediate enforcement priority. Those with scores of ten or less are tracked closely.

The number of systems with an ETT score of more than ten has decreased each of the last three years (see Table 8, below). In 2015, however, the DWGPD begins issuing violations related to the new Stage 2 Disinfection Byproducts Rule. So the number of CWSs with a score of more than ten will likely increase.

Table 8. Number of systems with a Drinking Water Enforcement Targeting Tool score of more than ten.

PWS Type	ETT Report Date Jan 2013	ETT Report Date Jan 2014	ETT Report Date Jan 2015
CWSs	31	14	10
NTNCs	2	2	2
TNCs	22	18	15

Table 9. Systems with a Drinking Water Enforcement Targeting Tool score of more than ten as of December 2014.

WSID	Water System Name	PWS Type	ETT Compliance Score
VT0000254	BARN RESTAURANT TAVERN	TNC	25
VT0002518	DOVEBERRY INN	TNC	25
VT0004547	SUNSET LODGE	TNC	24
VT0005240	HEMLOCK RIDGE CONDOMINIUM	CWS	24
VT0020760	EAST MOUNTAIN MHP	CWS	20
VT0005535	SUNNY ACRES DEVELOPMENT WATER ASSOC INC	CWS	19
VT0002115	BAYSIDE PAVILION	TNC	19
VT0021076	BURDICK MHP	CWS	18
VT0000765	LOCALFOLK SMOKEHOUSE	TNC	18
VT0020648	GARRISON	TNC	17
VT0020904	OAK HILL CHILDRENS CTR POWNAL PRESCHOOL	NTNC	16
VT0020669	PINE CREST MOTEL	TNC	16
VT0005628	ALTA GARDENS ESTATES	CWS	15
VT0020523	DERBY BOYS LLC	NTNC	15
VT0021297	MEADOWCREST CAMPGROUND	TNC	15
VT0001715	CHAUNCEYS	TNC	15
VT0020585	PROSPECT POINT GOLF CLUB	TNC	14
VT0005115	EAST BERKSHIRE WATER COOP	CWS	13
VT0005238	PICO VILLAGE WATER CORP	CWS	13
VT0000131	NORTON RESTAURANT	TNC	13
VT0005565	JAY PEAK WATER SYSTEM	CWS	12
VT0005153	HYDE PARK FIRE DISTRICT 1	CWS	12
VT0005023	MANCHESTER MHP	CWS	12
VT0021367	ALLEN BROTHERS INC	TNC	11
VT0001045	MATTERHORN INN	TNC	11
VT0020844	BARREWOOD CAMPGROUND	TNC	11
VT0002033	TOWNSHEND DAM DINER	TNC	11

While compliance with the drinking water standards is a useful measure of capacity, it does not indicate whether a system will have adequate capacity in the future. Any system could quickly fall out of compliance due to a number of factors, including changing water quality, degrading infrastructure, increasing regulations, or changes in staff. The revised capacity development strategy will include new ways to evaluate and enhance a system’s technical, managerial, and financial capabilities.

As discussed above, in 2014 all community water systems were asked to complete a capacity questionnaire. Fifty-five percent of the CWSs (232 of 420) responded to the survey. The questionnaires were designed to help determine whether the water systems have adequate capacity and how to make them more sustainable.

In the questionnaire, each system was asked how strongly they agreed with the following statements:

1. My system has adequate technical capacity,
2. My system has adequate managerial capacity, and
3. My system has adequate financial capacity.

The questionnaire included the same definitions for and examples of technical, managerial, and financial capacity that are in the introduction to this report. Based on the results (see below), the vast majority of the systems believe that they have adequate technical, managerial, and financial capacity. But the data also shows that many systems do not believe that they have adequate technical or financial capacity (seven and eleven percent, respectively). And 17 percent neither agreed nor disagreed that they have adequate financial capacity. This indicates that many public water systems need to improve their capacity, and that they are most concerned about financial issues.

Table 10. Questionnaire results from community water system’s self-assessment of their technical, managerial, and financial capacity.

System Response	My system has adequate technical capacity			My system has adequate managerial capacity			My system has adequate financial capacity		
	% of Small CWSs*	% of Large CWSs*	% of Total CWSs	% of Small CWSs	% of Large CWSs	% of Total CWSs	% of Small CWSs	% of Large CWSs	% of Total CWSs
Strongly Disagree	4%	2%	3%	1%	2%	2%	3%	2%	3%
Disagree	5%	2%	4%	2%	0%	1%	7%	11%	8%
Neither agree nor disagree	12%	12%	12%	8%	7%	8%	15%	19%	17%
Agree	36%	53%	42%	45%	52%	48%	47%	47%	47%
Strongly agree	42%	30%	38%	43%	39%	41%	27%	20%	25%

* - Small CWSs are those serving 500 or fewer people and large CWSs are those serving more than 500 people.

Capacity Development – Looking Forward

The Capacity Development Program’s goal is to help ensure that Vermont’s public water systems are sustainable. Sustainable drinking water systems have the technical, managerial, and financial capabilities to provide their customers a sufficient quantity of clean, safe water in a cost-effective manner - now and into the future.

“You cannot have a first rate community...with third rate infrastructure”– Source unknown

As drinking water infrastructure continues to age and degrade, public water systems will struggle to be sustainable. Many community systems have not made the investments needed to properly maintain, repair, rehabilitate, and replace their assets. EPA estimates that Vermont needs to invest more than \$510 million in public drinking water infrastructure in the next twenty years to ensure the health, security, and well-being of our communities (Drinking Water Infrastructure Needs Surveys and Assessment, Fifth Report to Congress, April, 2013). This estimate does not include money for on-going operations and maintenance.

Money from utility reserves and public financing will not be enough to address Vermont’s drinking water infrastructure needs. This financial shortfall presents the greatest challenge for most public community water systems. Systems need to invest more money in drinking water infrastructure. And managers need to use better financial and management practices to operate, maintain, repair, rehabilitate, and replace assets. Otherwise, we will not be able to continue to rely on our drinking water infrastructure for disease protection, fire protection, basic sanitation, economic development, and to support our quality of life. In 2015, the Capacity Development Program will revise its strategy to include new tools and initiatives to help systems meet this challenge.

Appendix A. Drinking Water System Capacity Questionnaires

Capacity Questionnaire for Systems Serving More Than 500 People

1.	Water System Name: WSID #
2.	<p>Role(s) of the people completing this survey (check all that apply)</p> <p> <input type="checkbox"/> Owner (e.g., Select Board Member, Sole Owner) <input type="checkbox"/> Administrative Contact (Owner’s representative) <input type="checkbox"/> Operator <input type="checkbox"/> Financial Planner <input type="checkbox"/> Engineer <input type="checkbox"/> Other: _____ </p> <p><i>Note – Per the Vermont Water Supply Rule, both the owner and operator are equally responsible for successful operations and maintenance of a public drinking water system. Therefore, the expectation is that both the owner and operator will work together to answer the survey questions.</i></p>
3.	<p>Please rate how strongly you agree with each of the following statements about your system’s technical, managerial, and financial capacity.</p> <p>A. My system has adequate technical capacity.</p> <p>Technical capacity means the physical and operational ability of the system to serve customers now and in the future. Examples of strong technical capacity include:</p> <ul style="list-style-type: none"> • The system has qualified operators with the knowledge and skills to operate the system. • The system’s infrastructure (i.e., source, storage tanks, treatment plant, and distribution network) can meet current and anticipated demand. • The system’s infrastructure is adequately protected, treated, and sampled. • The system’s infrastructure is in good condition. <p> <input type="checkbox"/> 1 - Strongly disagree <input type="checkbox"/> 2 - Disagree <input type="checkbox"/> 3 - Neither agree or disagree <input type="checkbox"/> 4 - Agree <input type="checkbox"/> 5 - Strongly agree </p> <p>B. My system has adequate managerial capacity.</p> <p>Managerial capacity means the system has the administrative and organizational ability to be successful now and in the future. Examples of strong managerial capacity include:</p> <ul style="list-style-type: none"> • Owners, managers, and operators are accountable and knowledgeable about the water system. • Owners, managers, and operators receive ongoing training. • We plan for current and future needs. • We interact well with customers and regulatory agencies. <p><input type="checkbox"/> 1 - Strongly disagree</p>

	<input type="checkbox"/> 2 - Disagree <input type="checkbox"/> 3 - Neither agree or disagree <input type="checkbox"/> 4 - Agree <input type="checkbox"/> 5 - Strongly agree <p>C. My system has adequate financial capacity.</p> <p>Financial capacity means the system can generate or obtain enough funds to maintain the system and pay for future improvements. Examples of strong financial capacity include:</p> <ul style="list-style-type: none"> • System revenue pays for the full cost of providing services. • We know and can measure all costs and revenues. • Reserves are available for unexpected expenses. • We use good budgeting and accounting practices. • We can access capital through public or private sources. <input type="checkbox"/> 1 - Strongly disagree <input type="checkbox"/> 2 - Disagree <input type="checkbox"/> 3 - Neither agree or disagree <input type="checkbox"/> 4 - Agree <input type="checkbox"/> 5 - Strongly agree
4.	<p>One of our goals is to develop new outreach/educational materials to help water systems. Which of the following topics would be most beneficial to your system? (Choose up to three priorities)</p> <input type="checkbox"/> Board member/water system decision-maker duties <input type="checkbox"/> Asset management program <input type="checkbox"/> Ordinances and bylaws <input type="checkbox"/> Funding sources and coordination <input type="checkbox"/> Fiscal planning and rate setting <input type="checkbox"/> Water audits and water loss reduction <input type="checkbox"/> Strategies for addressing compliance issues <input type="checkbox"/> Water system collaboration <input type="checkbox"/> Rule requirements, including the new Revised Total Coliform Rule <input type="checkbox"/> None <input type="checkbox"/> Other (Please specify): _____
5.	<p>How many paid staff does your water system have? This includes part-time workers, but not select board members or other elected officials who may receive a stipend.</p> <input type="checkbox"/> None <input type="checkbox"/> None, but we have a contractor operator <input type="checkbox"/> 1-2 <input type="checkbox"/> 2-4 <input type="checkbox"/> 5 or more
6.	<p>Is there an organizational structure with clearly defined roles?</p>

	<input type="checkbox"/> Yes <input type="checkbox"/> No
7.	<p>Does your water system's governing body hold duly warned meetings on a regular basis?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
8.	<p>Do you have access to adequate legal, financial, and technical support when needed?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
9.	<p>Does your system have a secure record-keeping system for both financial and non-financial records, with back-ups if feasible, that foster organization and efficiency, and that could be used to help protect against possible legal consequences in the future?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
10.	<p>Does the system have a master list indicating how and where different types of documents (e.g., property deeds, operations data, customer records) are to be filed and kept?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
11.	<p>How many people have served in the primary certified operator position in the past 10 years?</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2-3 <input type="checkbox"/> 4 or more
12.	<p>Do you have a back-up operator that can fill in if the primary operator is sick, takes a vacation, etc.?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
13..	<p>Do you have a plan in case a key person can't work for an extended period of time, leaves or retires (e.g. do you have ways to retain institutional knowledge)?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
14.	<p>Does the organization have clearly defined goals and are they consistent with customer needs and</p>

	<p>expectations?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
15.	<p>Does the system have procedures in place to receive, document, and respond to customer complaints/questions in a timely fashion?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
16.	<p>Are the customers satisfied with the quality of water and service the system provides?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
17.	<p>Is the system in compliance with permit and other state drinking water requirements?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
18.	<p>Did the system impose any water use restrictions in the past 5 years?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>If yes, was the restriction related to (check all that apply):</p> <p><input type="checkbox"/> Drought</p> <p><input type="checkbox"/> Treatment capacity</p> <p><input type="checkbox"/> Distribution or storage capacity</p> <p><input type="checkbox"/> Raw water supply source</p> <p><input type="checkbox"/> Water quality (e.g., a boil water notice)</p> <p><input type="checkbox"/> Water purchase contract</p> <p><input type="checkbox"/> Minimum stream flow requirements</p> <p><input type="checkbox"/> Other (please specify): _____</p>
19.	<p>Does your system have a complete, up-to-date written or electric plan (e.g., Water System Master Plan, Comprehensive System Facility Plan, Asset Management Plan, or other) that is actively used to operate and manage your water system?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
20.	<p>Please indicate whether the organization has the items listed below and, if so, when it was most recently updated (or when it was developed if it has not been updated):</p>

		Most recent version
By-laws	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Drinking Water Ordinances	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Asset Management Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Operations and Maintenance (O&M) Manual	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Source Protection Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Comprehensive Engineering Report	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Long Range Plan or Capital Improvement Plan	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Map of Distribution System	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Schematic of Treatment Plant	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Engineering as-built record drawings	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years
Sampling plans (i.e., total coliform, disinfection byproducts, lead and copper, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years

21.	<p>If the system has water ordinances, do they include a provision that allows the organization to discontinue service to a connection if it may pose a contamination risk to the water system?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable; we don't have water ordinances</p>
22.	<p>Does the organization have an inventory of its system components (i.e., assets) that includes their age, location, condition, estimated replacement cost, and when you expect to have to replace them?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
23.	<p>Has the organization evaluated its components to determine which ones are most likely to fail (e.g., because they have surpassed their useful life, are susceptible to damage from floods, etc.); and how severe of an impact there would be if the asset failed?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
24.	<p>Does the organization understand and monitor key operational aspects of the distribution system (e.g., pressure, flow, quality)? Have these aspects been documented?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
25.	<p>Does the organization tend to conduct maintenance activities in a reactive manner as opposed to a planned and proactive manner?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
26.	<p>Does the organization have a maintenance procedure in place for routine repair and replacement of system components?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
27.	<p>Do you keep detailed records of routine and emergency maintenance activities?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
28.	<p>Does the system have a program in place to identify which service connections might pose a backflow/cross connection hazard, and to require measures to reduce potential health impacts</p>

	<p>from these hazards?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
29.	<p>Has the organization conducted an all-hazards vulnerability assessment (safety; natural disasters including flood and erosion hazards; environmental risks; etc.)?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
30.	<p>Has the system prepared an all-hazards emergency response plan?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>If so, when was it most recently updated?</p> <p><input type="checkbox"/> 1-5 years</p> <p><input type="checkbox"/> 6-10 years</p> <p><input type="checkbox"/> More than 10 years</p>
31.	<p>Does the organization have an emergency or supplemental water supply?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>If yes, what type?</p> <p><input type="checkbox"/> Backup well(s)</p> <p><input type="checkbox"/> Backup surface water source(s)</p> <p><input type="checkbox"/> Connection with another system</p> <p><input type="checkbox"/> Other (please specify): _____</p>
32.	<p>Does your system own a generator(s) with capacity to power the critical components of your system and supply water to all of your customers during a power outage?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No – But we have an emergency interconnection that can supply customers with basic service for at least 24 hours without the need for any pumping.</p> <p><input type="checkbox"/> No – But we have gravity storage that can supply customers with basic water service for at least 48 hours without the need for any pumping.</p> <p><input type="checkbox"/> No</p>
33.	<p>Does your water system meter water production and usage?</p> <p><input type="checkbox"/> Yes</p>

	<input type="checkbox"/> No
34.	<p>Has your system completed a water audit in the last 5 years?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
35.	<p>Does the organization analyze current and anticipated customer demands, including planning for future growth or population decline?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
36.	<p>Do you anticipate future growth in the following areas (check all that apply)?</p> <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Wholesale (i.e., sale of water to another system) <input type="checkbox"/> Other <input type="checkbox"/> No, we do not anticipate any future growth.
37.	<p>Has the system performed a long-term water supply and demand analysis?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
38.	<p>Is the system permitted to expand (i.e., connect new users)?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No <p>If “yes”, does the system keep track of its water allocations?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No
39.	<p>Does your source(s) have enough water to meet the current and possible future needs of your water system?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> Not applicable – we purchase our water from another system
40.	<p>If water is purchased from or treated by another system, do you have an agreement that provides</p>

	<p>your system a water allocation for future growth?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Don't know</p> <p><input type="checkbox"/> Not applicable – we don't purchase water</p>
41.	<p>Are your water system's treatment and storage capacities adequate to meet current and future needs?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Don't know</p>
42.	<p>Is your system willing to consider connecting to a nearby water system, forming a consolidated system?</p> <p><input type="checkbox"/> There is not another system near our system.</p> <p><input type="checkbox"/> Yes – We want to connect to a nearby system, but haven't reached an agreement to do so.</p> <p><input type="checkbox"/> Yes - We would consider consolidating with a nearby system.</p> <p><input type="checkbox"/> Maybe – We would need to understand the potential costs and benefits first.</p> <p><input type="checkbox"/> No – We are not willing to consolidate with a nearby system, but would consider an interconnection with another system.</p> <p><input type="checkbox"/> No – We are not willing to consolidate with a nearby system.</p>
43.	<p>Does your system prepare and follow a budget each year?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
44.	<p>Does your budget represent the full cost of the services you provide (i.e., operating expenses, debt payments, budgeted annual payments into your reserve accounts, etc.)?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
45.	<p>How often does your system compare operating expenses with operating revenue?</p> <p><input type="checkbox"/> Monthly or quarterly</p> <p><input type="checkbox"/> Semi-annually or annually</p> <p><input type="checkbox"/> Rarely or Never</p>
46.	<p>Are financial statements prepared on a routine basis (i.e., monthly, quarterly, or annually)?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>

47.	<p>Which of the following best describes your rate structure?</p> <p><input type="checkbox"/> Unmetered flat rate – Services are not metered and every customer pays the same rate.</p> <p><input type="checkbox"/> Metered flat rate (i.e., uniform block rate) – The cost of each billing unit (e.g., 1,000 gallons or 100 cubic feet of water) stays the same regardless of how much water is used.</p> <p><input type="checkbox"/> Declining block rate – The cost of each billing unit decreases as the amount of water used goes up (e.g., the first billing unit is charged at one rate, subsequent units are charged at lower rates).</p> <p><input type="checkbox"/> Inclining block rate – The cost of each billing unit increases as the amount of water used goes up (e.g., the first billing unit is charged at one rate, subsequent units are charged at higher rates).</p> <p><input type="checkbox"/> Seasonal (combined with another rate structure) – The cost of each billing unit increases or decreases according to water demand and weather conditions (costs are usually higher in the summer months).</p> <p><input type="checkbox"/> Other</p>
48.	<p>Do you review your rate structure on a routine basis?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
49.	<p>What is the average charge for water service, per year, for a single-family home assuming usage of 150 gallons per day (54,750 gallons per year)?</p> <p style="text-align: center;"> <input style="width: 150px; height: 20px; border: 1px solid black;" type="text"/> </p> <p>Note: Please exclude charges for wastewater/stormwater/fire protection/etc. that are not directly associated with water service. Costs that should be included are debt service on water system facilities, operational costs and prorated share of administrative and other staff and services.</p>
50.	<p>How many times has the water system’s rate been increased in the past 10 years?</p> <p><input type="checkbox"/> 0</p> <p><input type="checkbox"/> 1-2</p> <p><input type="checkbox"/> 3-4</p> <p><input type="checkbox"/> 5 or more</p>
51.	<p>Are the rates charged adequate to pay the bills, put some funds away for the future, and maintain, repair, and replace equipment and infrastructure as needed (i.e., are O&M, capital investment/debt servicing, and other costs covered)?</p> <p><input type="checkbox"/> Yes</p>

	<input type="checkbox"/> No
52.	Does the income produced from your current rate structure exceed operating expenses (including debt service)? <input type="checkbox"/> Yes <input type="checkbox"/> No
53.	Does your system maintain and contribute to reserve funds for the following (check all that apply)? <input type="checkbox"/> Operating cash reserves <input type="checkbox"/> Emergency reserves <input type="checkbox"/> Replacement reserves for short-lived (10 years or less) assets <input type="checkbox"/> Capital improvements reserves <input type="checkbox"/> None of the above
54.	Does your system have formal policies for collections on delinquent accounts and discontinuance of water service for non-payment? <input type="checkbox"/> Yes <input type="checkbox"/> No
55.	Are the annual delinquent accounts less than 5% of the system's annual operating budget? <input type="checkbox"/> Yes <input type="checkbox"/> No
56.	Does your water utility support or contribute to other enterprise funds or the general fund? <input type="checkbox"/> Yes <input type="checkbox"/> No
57.	Does your system require revenues from other enterprise funds or the general fund for normal operations? <input type="checkbox"/> Yes <input type="checkbox"/> No
58.	Which source would likely contribute the most funds to complete future capital improvements? (please answer regardless of whether you have a plan to make improvements) <input type="checkbox"/> Water system funds (ex. savings or reserves) <input type="checkbox"/> Line of credit/private loan (ex. bank loan) <input type="checkbox"/> Government loan (ex. State revolving fund loan) <input type="checkbox"/> Government grant (ex. Community development block grant)

59.	<p>Has your system implemented an outreach plan to educate and gain the support of your stakeholders/customers in the improvement of your water system?</p> <p><input type="checkbox"/> Yes – We have implemented a plan <input type="checkbox"/> No – We have started a plan, but it is not complete <input type="checkbox"/> No – We have not done any planning</p>
60.	<p>Does the organization perform active customer and stakeholder outreach and education to understand concerns and promote the value of safe drinking water?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
61.	<p>Does the organization actively engage with local decision makers, community and regulatory representatives, etc. to build support for its goals, resources, and the value of the services it provides?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
62.	<p>Does the system participate in local and regional community and economic development planning activities?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
63.	<p>Which of the following are the highest priorities for your water system right now? (Please choose no more than three items)</p> <p><input type="checkbox"/> Training and/or retaining staff (e.g., operator and board member) <input type="checkbox"/> Creating or updating bylaws and/or water ordinances <input type="checkbox"/> Replacing infrastructure <input type="checkbox"/> Addressing compliance directives or a known public health issue (only choose this if your water system has a compliance or public health issue that it needs to address) <input type="checkbox"/> Obtaining financial sustainability (e.g., setting rates that reflect the full cost of the system) <input type="checkbox"/> Meeting current and/or anticipated demand <input type="checkbox"/> Creating or updating an asset management program, water system master plan, or other tool to help manage the water system. <input type="checkbox"/> Other (Please specify): _____</p>
64.	<p>Are you part of a group with other water systems in your area that meets on a regular basis to discuss issues, coordinate efforts, etc.?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No, but I'm interested in joining such a group.</p>

	<input type="checkbox"/> No, and I'm not interested in joining such a group.
65.	<p>Are you interested in receiving assistance from our Capacity Program?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, please briefly describe the type of assistance you would like below.</p>

Appendix B. Capacity Development Initiatives Completed in Previous Years

Capacity Initiative	Status	Target Audience	Notes
Transient non-community (TNC) Water Quality Monitoring Project	Completed	TNCs	In 2002, the program developed a cost estimate for conducting quarterly compliance monitoring for all TNCs in the state. At the time, TNCs were only taking annual coliform samples. The goal of the project was to help TNCs transition to quarterly monitoring. Using the cost estimate, the TNC Program hired contractors to collect quarterly samples during 2004 and 2005, prepare a sampling plan for each system, and teach staff how to take samples properly. The samples were analyzed at the Department of Environmental Conservation's laboratory.
Engineering Technical Assistance	Completed	CWS, NTNC	DWGWPD had several engineering firms under contract to provide operational troubleshooting assistance to small public water systems.
Small System Templates and Self-Assessment	Completed	CWS, NTNC	Templates for O&M manual and long range plan, and a capacity assessment form was developed. These documents form the basis for some of the individual on-site and group-training sessions provided. Capacity assessments are completed for all loan applicants and are a prerequisite for both planning and construction loan eligibility. Additionally, a customer complaint policy form and <i>How to Form a Fire District</i> guidance document were developed.
Public Service Board (PSB) and Department of Public Service (DPS) Technical Assistance	Completed	Private, for-profit CWS (regulated utilities)	Beginning in early summer of 2009, DWGWPD met with representatives from the PSB and DPS to discuss better coordination between the three entities. The aim is to help the very smallest of regulated public water systems with rate review, tariffs, and reporting. This coordination is still in its early stages, but just starting the conversation is a significant milestone. Additionally, a guidance manual was developed to assist small systems in the rate approval process.
Consolidation Study	Completed	CWS	Consolidation Study was replaced with a Facilitation and Mediation contract beginning in June 2008.
Communication Workgroup	Completed	All PWSs	A workgroup was formed to evaluate and develop recommendations on mass mailing procedures, newsletters, use of the Electronic Bulletin Board, electronic communication with water systems, and general publicity issues. A number of those recommendations were implemented.
Reservoir Water Quality Study	Completed	Surface water CWS	The study collected and analyzed data on changes in source water characterization during the year for two small surface water bodies used by public community water systems in Vermont. Field data collection occurred between April 2002 and May 2003 for the Town of Brattleboro and City of St. Albans Water Systems. Data was analyzed and results evaluated and communicated to the participating water systems.
Comprehensive Performance Evaluation Program	Completed	CWS	Comprehensive performance evaluations were conducted on three surface water systems.
Small System Engineering Evaluations	Completed	CWS, NTNC	An extremely successful initiative and may resume in the future for those systems that did not already receive an evaluation.
Regulation of Consecutive Water Systems and New	Completed	CWS	Successful passage of H806 to Act 156 <i>An Act Relating to Public Water Systems</i> .

Water Line Extensions			
Asset Management Pilot	Completed	CWS	The DWGWPD and Village of Waterbury, a small drinking water system, collaborated on an asset management pilot project that ended in Spring 2013. The goal of the pilot was to populate CUPSS, the EPA-developed asset management program, using ArcGIS for a more efficient way to enter many hundreds to thousands of assets. The use of GIS to spatially locate and attribute assets for use in CUPSS had never been done successfully. The Village now has the frame work for an Asset Management Program. A report describing the project is available on our website at http://drinkingwater.vt.gov/capdev/pdf/waterburypilotproject.pdf
Determination of non-profit status	Completed	Loan Applicants	The DWGWPD was given the authority to determine if a water system was not-for-profit without being a tax-exempt (through the IRS) entity. This distinction is beneficial in it reduces a potentially significant time and money delay in the DWSRF loan process
WaterSense Pilot	Completed	NTNC	The Orange Center School has a history of seasonal water outages. It appeared that the problem might be solved through water conservation efforts. So the school was awarded a grant in 2012 to purchase and install new WaterSense labeled toilets and faucet aerators, and a new dishwasher. The fixtures helped significantly reduce water use and the school was able to stop hauling water temporarily. But shortages resumed, so the system is now planning to develop another water source. A report describing the project is available on our website.